

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION ESDS Reuse Working Group

Reuse WG Year in Review: 2009–2010

Reuse Readiness Levels (RRLs)

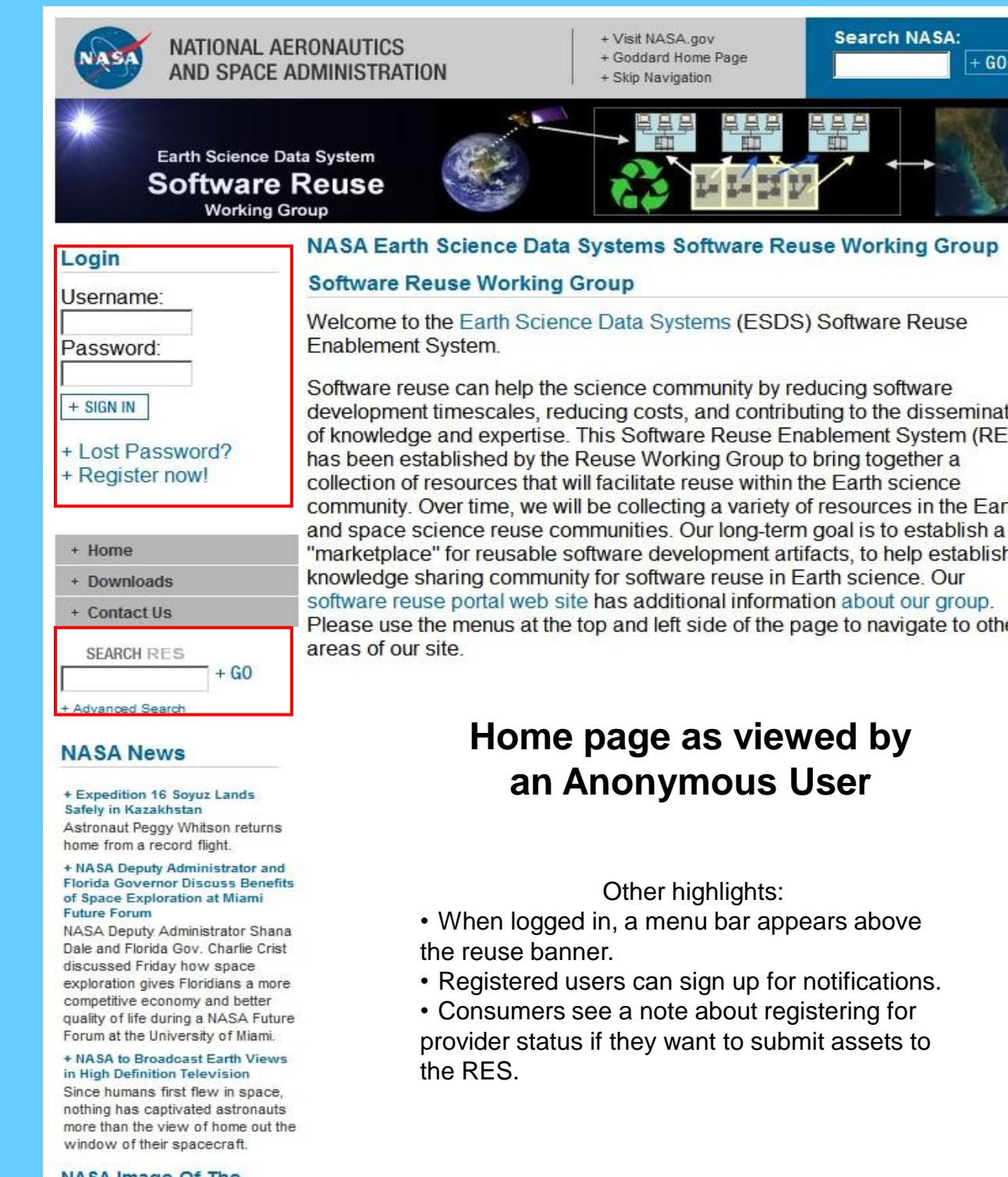
RRL Summary Table

RRLs can be used to assess software under development or software being considered for adoption. The summaries here are based on nine topic areas and their levels, which can provide a more detailed assessment.

Level	Reuse Readiness Level (RRL) Summary
RRL 1	Limited reusability ; the software is not recommended for reuse.
RRL 2	Initial reusability ; software reuse is not practical.
RRL 3	Basic reusability ; the software might be reusable by skilled users at substantial effort, cost, and risk.
RRL 4	Reuse is possible ; the software might be reused by most users with some effort, cost, and risk.
RRL 5	Reuse is practical ; the software could be reused by most users with reasonable cost and risk.
RRL 6	Software is reusable ; the software can be reused by most users although there may be some cost and risk.
RRL 7	Software is highly reusable ; the software can be reused by most users with minimum cost and risk.
RRL 8	Demonstrated local reusability ; the software has been reused by multiple users.
RRL 9	Demonstrated extensive reusability ; the software is being reused by many classes of users over a wide range of systems.

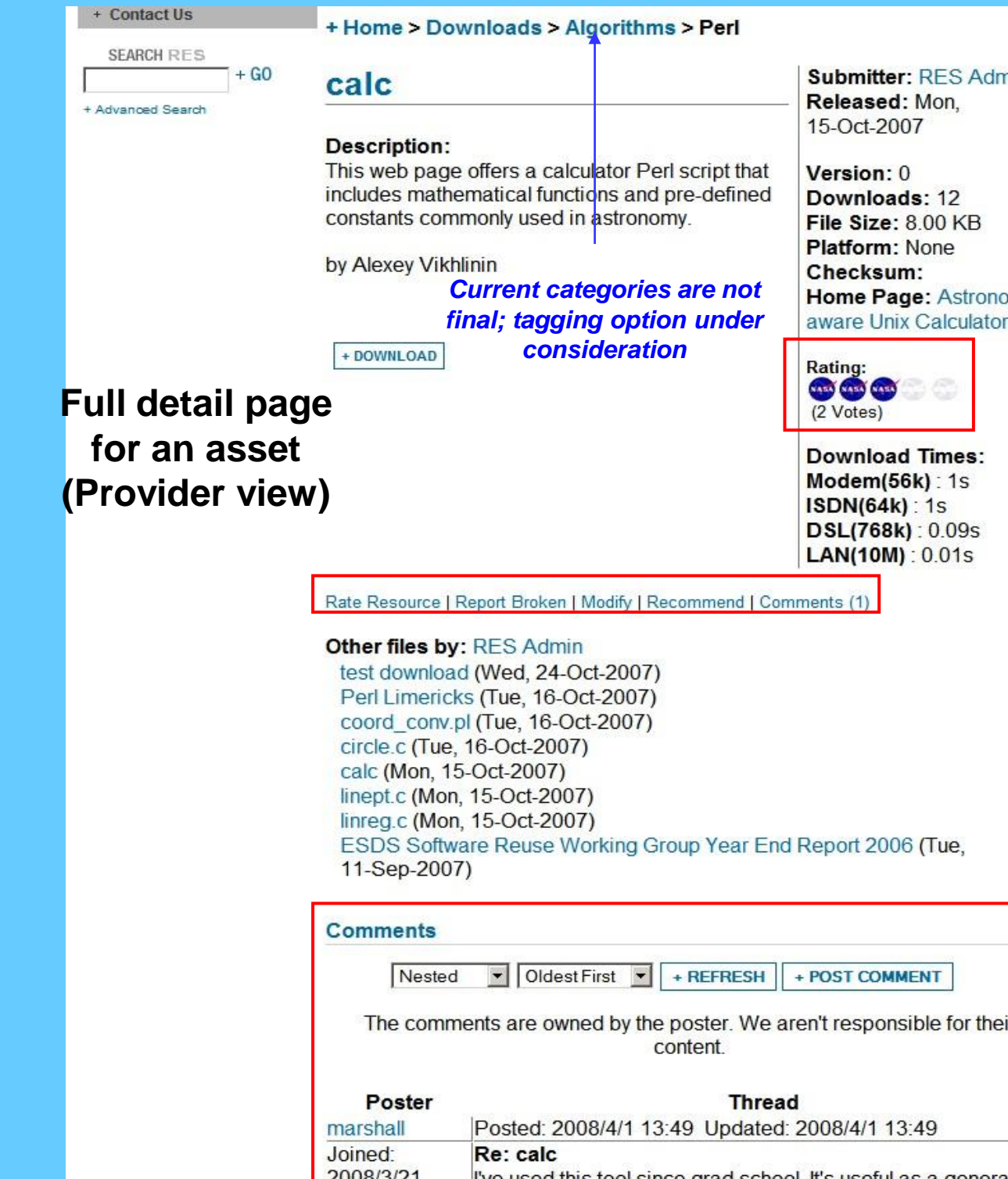
Following up on work from previous years, the WG's RRL activities culminated with a one-day workshop on April 7, 2010, to finalize the initial version of the RRL document. Recommendations from the workshop were addressed, and the RRL v1.0 document was released on April 30, 2010.
(http://www.esdswg.com/softwarereuse/Resources/rrls/RRLs_v1.0.pdf/view)

Reuse Enablement System (RES)



Home page as viewed by an Anonymous User

- Other highlights:
- When logged in, a menu bar appears above the reuse banner.
 - Registered users can sign up for notifications.
 - Consumers see a note about registering for provider status if they want to submit assets to the RES.



Full detail page for an asset (Provider view)

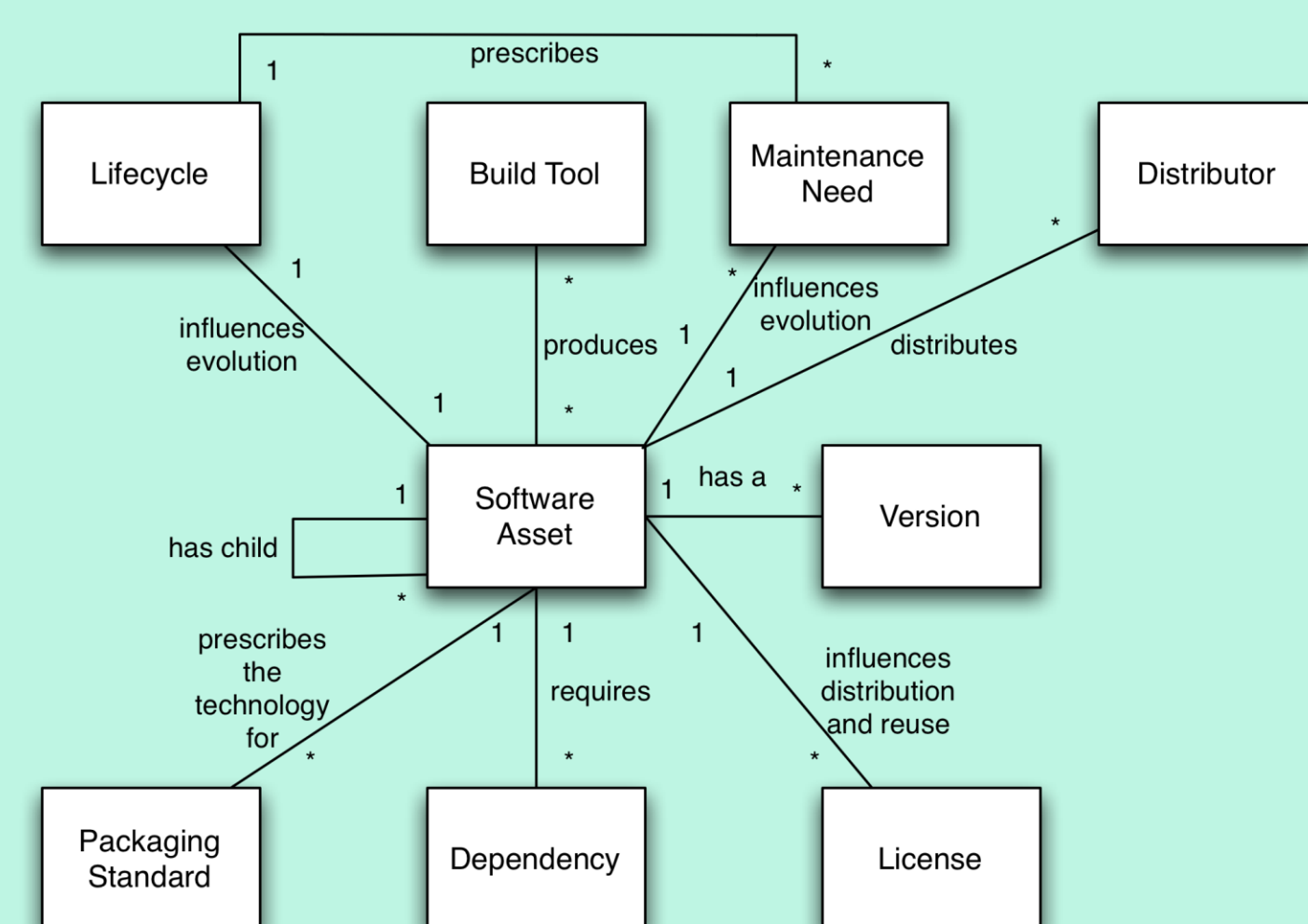
RES (first prototype)

The RES is designed to provide information about and easy access to reusable Earth science software assets in order to help developers achieve the benefits of reuse by encouraging systematic reuse. A few of the key features are outlined with red boxes in these screen shots.

After receiving direction from NASA Headquarters that per-mission systems should be considered, the WG began working with the upcoming Tier 1 decadal survey missions to help them document and track their reusable assets in instances of the proposed RES. So far, SMAP has an RES instance running and is beginning to populate it, while other missions have expressed interest in the RES.

Packaging Reusable Assets

In late 2009 and through 2010, the WG collected WG input on packaging reusable software assets for reuse by others. This information was used to develop a software packaging recommendation, the initial version of which is being finalized at this meeting. Release of the v1.0 document is planned for early November 2010.



Software Packaging Domain Information Model

Boxes represent concepts (attributes) relevant to the software packaging. Lines show their relationships and */1 indicates each relationship's cardinality.

Community Outreach (publications, presentations, etc.)

- 2009 AGU Fall Meeting, poster on RRLs (in WG's reuse session)
- 2009 AGU Fall Meeting, poster on reuse in NPP (in WG's reuse session)
- 2010 ESIP Winter Meeting, poster on reuse for decision making
- Book chapter in IN-TECH's Aerospace Technologies Advancements
- Reuse WG RRL Workshop and release of RRL v1.0 document
- *Earth Science Informatics* paper on reuse in systems
- *Data Science Journal* paper on RRL uses
- 2010 ESIP Summer Meeting, poster on reuse tools
- 2010 IGARSS, paper and poster on reuse in missions
- 2010 ESSI Workshop, presentation on tools for reuse
- 2010 IRI, paper and presentation on progress towards RES
- Managed the 2010 Peer Recognition Software Reuse Award process

Twitter feed – http://twitter.com/esdswg_reuse

- 4 followers, 3 from the Reuse WG

Facebook group – <http://www.facebook.com/group.php?gid=117453644936920>

- 21 members, 6 from the Reuse WG

LinkedIn group – <http://www.linkedin.com/groups?gid=2964349>

- 8 members, 7 from the Reuse WG

Decadal Survey Missions

- SMAP
 - Installed and deployed an instance of the RES in their ground system
 - Began to catalog/track ~5 science data system components which were reused from OCO
 - Also leveraging RRLs in ground and flight systems
- ICESat-2
 - Working to assess reusability of ICESat's SDMS
 - Leveraging RRLs and developing a procedure / template for making RRL assessments
 - Possible RES; interested in SMAP's experience
- DESDynI
 - In communication
- OCO-2
 - In communication

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For more information, please visit <http://www.esdswg.com/softwarereuse>

Basic Web Site Statistics

Last Year (10/2009 – 09/2010)

- 13,817 unique visitors
- 16,497 visits
- 33,427 page views
- 1,375 visitors per month (average)

All Time (12/2005 – 09/2010)

- 44,537 unique visitors
- 57,614 visits
- 142,108 page views
- 993 visitors per month (average)